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Invertebrate Conservation News



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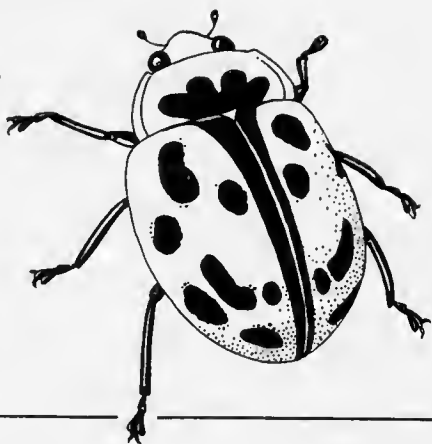
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INVERTEBRATE CONSERVATION NEWS



No. 55, February 2008

EDITORIAL

At a conference organised last autumn by the Zoological Society of London (see "Past UK meetings", below), the AES presented a poster which attracted considerable interest. The poster included pi-diagrams, showing the funds expended by UK conservation charities primarily on particular phyla or classes of animals during the previous financial year. The data showed that, despite the growth of Butterfly Conservation and the emergence of Buglife – The Invertebrate Conservation Trust, taxonomically directed spending is still devoted mainly to birds. An accompanying pi-chart showed that insects and other invertebrates account for most species-diversity. This was in stark contrast to the very narrow wedge that they occupied in the spending pi-chart; indeed, the data showed almost an inverse relationship between spending and species-diversity.

Admittedly, efforts to conserve particular taxa can bring benefits for others, since those efforts often help to protect and manage a range of habitats. The reverse may, however, be true when habitat management favours certain taxa at the expense of others. One often-quoted example has been the creation of 'scrapes' for wading birds, with consequent damage to the habitats of invertebrates dependent on freshwater seepages into brackish wetlands. Such damage reportedly occurs less often in the UK than formerly, thanks to improved communication between different taxonomic interest-groups. There is, however, another activity that seems worthy of concern and that has grown in recent years; i.e. the artificial feeding of wild birds and its consequences for invertebrate populations.



The AES book "*Habitat Conservation for Insects*", published in 1991, included a cautionary section about the feeding of wild birds. The underlying concern was based on the assumption that an artificially boosted bird population will consume far more wild invertebrates than the smaller population that would have survived without artificial feeding. The book quotes an estimate that a single family of Blue tits (*Parus caeruleus*) consumes about 20,000 invertebrates. It is explained in the same passage that, for the purposes of the book, conservation is described as involving the management of habitats; not the provision of food from outside sources.

As in 1991, there is little firm evidence either to confirm or to allay concerns about the harm that bird-feeding might indirectly cause to invertebrate populations. In principle, an increase in predation seems very likely but this is perhaps mitigated when birds are fed during periods of peak demand, making them less dependent on naturally occurring prey. Also, as mentioned in the book, birds tend to seek prey items that they come to recognise visually. This means that they tend to concentrate on the more common species of invertebrate, so that rare species might be spared from increased predation. Also, most invertebrates produce very large numbers of offspring, only a very small proportion of which need to survive in order to maintain colonies.

Without hard data, the true impact of bird-feeding on invertebrate populations cannot be assessed. It would therefore seem wise to adopt the precautionary principle and thus to regard this activity as potentially harmful. Nevertheless, most conservation organisations, at least in the UK, seem to be increasingly active in encouraging their members to feed wild birds. In particular, many of the UK's county wildlife trusts now distribute their magazines together with the catalogues of suppliers of wild bird food. At least one of these trusts is marketing such food in its own right. Admittedly, some of the commercial suppliers also supply products for the enhancement of invertebrate habitats (e.g. to provide nest sites for solitary bees). On the other hand, certain suppliers have advertised insect electrocution devices among their garden accessories.

Since conservation organisations are benefiting financially from the wild bird food business, anyone daring to express concern could perhaps be likened to someone standing in the face of a rising tide, even if he or she simply pleads for the precautionary principle to be considered and brought to the attention of the 'punters'. The punters are largely homeowners, who have a perfect right to manage their gardens as they wish, within the confines of the law. To gain pleasure from attracting birds to one's garden is arguably just as reasonable as



exercising one's choice of plant species and varieties. On the other hand, it is also reasonable to inform people about the possible consequences of their actions, both 'good' and 'bad'.

A more positive but, as yet, unrealised possible consequence of the lucrative nature of the wild bird food business is the potential to seek sponsorship for research on the ecological impacts of bird-feeding. There would clearly be a need for a binding guarantee that the research workers would be entirely free in devising the experiments or surveys and in publishing the results. Unfortunately, the most obvious kind of experimental comparison (i.e. involving 'feeding' and 'non-feeding' trials in a series of geographical plots) is probably not feasible in a country like the UK, where bird feeding is very widespread and rightly remains the choice of individual householders. Perhaps such research could be conducted in a country where those circumstances do not apply!



NEWS, VIEWS AND GENERAL INFORMATION

More information on cold water corals

Until the last few decades, it was widely believed that corals were confined to tropical and subtropical waters. As explained in *ICN* No. 44, cold water corals have quite recently been discovered throughout regions of the world where the temperature of seawater ranges between 4°C and 13°C; these include deep waters in tropical and subtropical areas. Many cold water corals are as spectacular as their warm water counterparts. For example, some gorgonian corals (sea fans) can form tree-like colonies up to 5 m in height (Freiwald *et al.*, 2004). Many species are also very colourful, especially the soft corals of the octocoral gardens of the North Pacific (Freiwald *et al.*, *op. cit.*)

The earlier *ICN* article includes information about some of the many species of cold water coral and the very diverse range of other invertebrates that inhabit their unique reef habitats. The present article draws on a few publications that have become available since 2004, including the international report '*Out of sight – no longer out of mind*' (Freiwald *et al.*, *op. cit.*).

As mentioned in the earlier article, deep sea trawling is perhaps the greatest threat to cold water corals, particularly since the 1980s, when the rockhopper trawl was developed. This has large rubber tyres,



enabling it to roll across any surface, although fisherman try to avoid trawling the roughest areas. Reefs that have developed over thousands of years are being converted to rubble by the use of such fishing gear. Freiwald *et al.* (op. cit) quote a study showing that, during a typical 15-day trip in the Rockall Trough, in the north-eastern Atlantic, a trawler sweeps approximately 33 km² of seabed.

Other damaging activities include the exploitation of gas and oil reserves, bio-prospecting and scientific dredging, the placement of underwater cables, waste disposal and other pollution. There is also concern that the proposed use of deep water as a repository for sequestered CO₂ might interfere with the formation of the carbonate skeleton of corals.

The earlier *ICN* article mentioned an UK government announcement in 2003 of an intention to apply SAC (Special Area of Conservation) designation to the Darwin Mounds, which lie approximately 1000 m deep in the Atlantic, about 150 km off the coast of north-west Scotland. The mounds, which are each about 5 m high and up to 100 m in diameter, are topped by colonies of the coral *Lophelia pertusa*, which support many other marine invertebrates, including sponges and brisingids. The mounds are now protected from trawling under EU law, but other methods of fishing, such as the use of gillnets and longlines is still allowed. The use of gillnets can also be very damaging due to the use of weights and anchors, which drag across the seabed (Freiwald *et al.*, *op cit.*), and also due to the use of equipment to recover them when they are lost.

The 110 km² Norwegian cold water reef that was mentioned in *ICN* No. 44 is the largest discovered in the world. Known as the Røst Reef, it has been protected from all deliberate destruction and parts of it have been protected from bottom trawling. Just to the south, a large proportion of the Sula Reef, which reaches 35 m in height, had been destroyed by trawling before it had been properly mapped. Further southeast, the Selligrunnen reef, the world's shallowest *Lophelia* reef, has been designated as a Marine Protected Area, in which all human activity is prohibited.

Elsewhere in Europe, several other important reefs have no protection; these include the Galicia Bank off northern Spain and Le Massif Corallien de la Grande Vasière off the Atlantic coast of France. In North America, protected areas have been established in Alaska, Florida and Nova Scotia. Many other important reefs occur in international waters, in which there is currently no legal mechanism for their



protection. Organisations such as WWF are pressing for such a mechanism to be developed under international law.

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Joint Nature Conservation Committee (undated), www.jncc.gov.uk/page-1449

Negative attitudes towards invertebrates?

The AES has recently received correspondence expressing concern about activities that seem to demonstrate negative attitudes towards invertebrates. One example has concerned the use of invertebrates on TV 'reality shows', in which the squeamishness of participants has been tested by making them hold living invertebrates between their teeth or (in some cases outside the UK) to lie semi-naked in tanks while cockroaches walk over them. Close contact with invertebrates can encourage positive attitudes towards them, as exemplified by a slogan of the AES Bug Club: "cuddle a cockroach". In contrast, the TV reality shows seem to be reinforcing negative attitudes about 'creepy crawlies'.

There have been expressions of concern that certain TV shows involve cruelty to invertebrates. Although such concerns are not generally considered to be borne out by current scientific understanding, there is justification for precautionary guidance against deliberately subjecting invertebrates to adverse conditions or treatment. Guidance is, for example, issued to everyone who wishes to sell live invertebrates at AES exhibitions. It might be hoped that the media should be setting examples in these matters and encouraging people to respect their fellow species, even if they have more than four legs or none.

A call to defend the right to collect voucher specimens

The need to collect invertebrates from the wild in order to study them and, in particular, to provide voucher specimens has always been stressed in the long-standing debate as to whether restrictions on collecting are justified. The argument in defence of the right to collect specimens, as vouchers or otherwise, has, however, generally been rather low-key. The assumption has perhaps been that the arguments are self-evident and do not therefore need to be broadcast from the rooftops. Also, there has probably been a fear that too active a stance might attract abuse from people who think that it is simply wrong to take any kinds of specimens from the wild.



In a recent editorial for the Autumn 2007 edition of the journal *Atropos*, Mark Tunmore has commented on the conflict that seems increasingly to exist between traditional entomologists, who value the right to be able to examine specimens in detail, and a new breed of insect-watchers, many of whom come from the 'birding' community and who enjoy watching wildlife rather than seeing it collected.

Mark Tunmore argues that there is no simple answer to say whether it is right to be free to take a specimen, when this means that other people are thereby unable to see it flying freely. A much more strongly worded article by Prof. Philip S. Corbet of the University of Edinburgh (Corbet, 2007) has created some controversy. He calls for active policies to be introduced so as to counteract the threats that he believes are undermining the future of entomology in Britain. His own experience, as related in the article, has been unfortunate. In 1998, he was reportedly abused by people at a nature reserve in Cornwall for attempting to secure a voucher specimen of a vagrant North American dragonfly, the Green Darner *Anax junius*. He was forced to release the specimen and could not therefore be completely sure whether it was *A. junius* or the native species *A. imperator*. He also describes a similar incident in Ireland during 2000, involving Robert Thompson, an expert on dragonflies, who tried to secure a voucher specimen of *A. imperator*; this would have been the first definitive record of the species in Ireland at the time.

Prof. Corbet identifies two threats to entomology. The first of these, in his view, is the paradigm that 'large insects can be identified by sight alone and that anyone who collects and kills (or even captures) an insect is committing an act that is ethically unacceptable and inimical to the aims of nature conservation'. The second threat, he argues, arises from 'a widespread human trait: to maintain a low profile when confrontation or controversy threatens'.

As far as the first threat is concerned, there are various authoritative publications that logically explain that it is necessary to collect specimens. These include the widely accepted code for collecting, published by Invertebrate Link (2002), of which Prof. Corbet had unfortunately seen only an old edition at the time of writing his article. The code explains that collecting does not threaten invertebrate populations, provided that certain safeguards are observed. These include avoidance of harm to habitats and the exercise of general moderation and of legal compliance and/or special restraint with regard to the most vulnerable species. The code is not, however, designed as an active defence of the right to collect. The same is true of another



Invertebrate Link document (awaiting release), which identifies criteria by which certain species, (almost by definition a very small minority), may rationally be proposed for legal protection from collecting.

Prof. Corbet clearly believes that entomologists should be far more active in defending the need to collect specimens. He calls for the entomological societies, to take a more active stance in doing so, within the confines of an accepted code of conduct (which does of course already exist). It remains to be seen, however, whether all his proposals will be taken up. These largely concern the need for compliance with a code but he also proposes that the societies should call upon other organisations, who have birdwatchers as members, to denounce anti-collecting activities and to state that any of their members who indulge in such activities are likely to have their membership terminated.

In expressing his concern about entomologists keeping a low profile, Prof. Corbet has perhaps touched upon something that has been left largely unstated, but that will now have to be debated more in public.

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SITES AND SPECIES OF INTEREST

Thames Basin Heaths, south-east England

The Thames Basin is one of the most populous and urbanised parts of Europe, with London at its centre. Agricultural areas occupy the richer soils in areas not covered by buildings and infrastructure, but the basin includes extensive outcrops of acid and relatively infertile Bagshot Sand in the counties of Surrey, Berkshire and Hampshire, to the south-west of London. The Thames catchment also includes part of the outcrop of Lower Greensand within the Hampshire Basin. A high proportion of these sandy areas is covered by woodland, heathland or acid grassland, including tracts of common land and military training areas. The combination of heathland and a relatively warm climate (by British



standards) provides conditions suitable for many invertebrates whose UK distribution is largely or wholly confined to this region or to the Dorset heaths further south-west.

Due to the absence of intensive agriculture, together with the exclusion of land use other than military training in some areas, the heathland invertebrate fauna of the Thames Basin Heaths has fared reasonably well despite continued urban incursion. There is, however, a greatly augmented programme of house building, intended to match the increase not only in the human population, but also in the relative number of households. The authorities that have responsibility for planning within the area have a duty to protect wildlife habitats; they include the umbrella organisation known as the South-east Regional Authority (SERA).

SERA has been running a consultation on urban development of the Thames Basin Heaths. This is being done in the context of legal requirements for habitat conservation, which are imposed under the European Habitats Directive and the Birds Directive. In order to comply with these directives, the UK government designated the heaths as a Special Protection Area (SPA) in March 2005, specifically to protect the habitats of three bird species: the nightjar *Caprimulgus europaeus*, woodlark *Lullula arborea* and Dartford warbler *Sylvia undata*. These are listed in Annex I of the EU Habitats Directive and in the Birds Directive.

Under the SPA designation, the government has a duty to restore and maintain the habitat at 'favourable conservation status'. Currently, the Thames Basin Heaths SPA is considered to have unfavourable status owing to degradation of habitat. In view of this requirement, further urban development can be approved only when certain measures have been established, so as to mitigate the adverse effects of increased site usage by people and their dogs.

Some of the mitigation measures should help to protect the habitats not only of the three bird species that are receiving special treatment, but also of other forms of wildlife. One of these measures is to designate areas as Suitable Accessible Natural Green Space (SANGS), so as to divert sufficient people from using the Thames Basin Heaths SPA to ensure there is no nett increase in recreational use. There is, however, some cause for concern about the effects of increased recreational pressure on sites that are to be designated as SANGS.

Another of the mitigation measures seems to give considerable cause for concern. This is the proposed surfacing of paths so as to encourage people to use the paths, rather than to trample on sensitive areas. It



would also provide year-round access for fire-fighting vehicles, although presumably most fires occur in the summer, when unsurfaced paths might be largely sufficient. Since the surfacing of paths brings about a tangible result, it is seen as a suitable means of spending money which is to be paid by developers as a contribution towards mitigation.

Unfortunately, the proposal to improve paths seems not to take account of the importance of bare ground that they provide. Bare ground habitats are essential for a range of insects, including many Diptera and aculeate Hymenoptera, as well as tiger beetles. Loss of this habitat could therefore cause serious harm to populations of many invertebrate species, due to a legalistic focus on three bird species. The measure is supported by Natural England (NE), but this stance seems inconsistent with NE's need to support Biodiversity Action Plans for invertebrates that need bare ground. These include the bee-fly *Thyridanthrax fenestratus*, a rare species which parasitises the nests of the sand wasp *Ammophila pubescens*. Other examples are the bee-fly *Bombylius minor* and the wasp-mimicking hoverfly *Chrysotoxum octomaculatum*.

It might be possible to manage areas other than paths so as to establish a succession of bare ground habitats, as occurs naturally on soft rock cliffs. Such management might, however, seem at odds with the specific objectives that have been developed for the above three bird species. In that context, there is concern about erosion, which is apparently seen as an entirely bad thing, rather than a source of habitat for a wide range of species.

The SERA consultation is due to end on 15th February, before this issue of *ICN* is due to be published, but submissions are being sent by individuals concerned about the apparent lack of consideration of habitats other than those of the three listed bird species.

Captive breeding programme for rare Bermudan land snail

The Zoological Society of London (ZSL) reports good progress in breeding the endemic Bermudan land snail *Poecilozonites circumfirmatus*, at the request of the Bermuda Natural History Museum. By 2004, when the programme started, the wild population was feared to have fallen to critically low levels due to predation by the introduced snail *Euglandina rosea* and the Argentine ant *Linepithema humile*. Studies at London Zoo include the dynamics of the life cycle and the identity of symbiotic gut-inhabiting Protozoa that will need to persist until any snails are released into the wild. There will of course be a



need for measures to protect any colonies that are to be re-established in Bermuda.

Lawsuit over giant earthworm in Washington State, USA

ICN No. 50 included an article about the Palouse giant earthworm *Driloleirus americanus* (also known as the lily worm because of its pleasant scent when handled), which occurs in the Washington-Idaho region known as the Palouse. This once-abundant species, which can attain a length of 90 cm (3 feet), was found in 2005 for the first time since 1978. It has been adversely affected by introduced European species and by habitat destruction; in this instance, within the rich soils of the Palouse bunchgrass prairies, where its burrows have been found to extend as deep as fifteen feet (nearly five metres) during dry weather.

A recent press report brought the news that environmental groups are asking a federal court to overturn a ruling that the species does not merit Endangered Species Act protection. The ruling was issued by the U.S. Fish and Wildlife Service finding last October, even though the low numbers of the species indicate that it might be close to extinction.

Australian butterflies threatened by climate change

Some invertebrates appear to be responding to climate change by colonising areas beyond their former geographic ranges. Unfortunately, however, there are geographical barriers to the spread of many other species. In Australia, for example, narrow coastal strips of moist, subtropical habitat have been drying out. With the sea on one side and arid lands on the other side, there is no possibility of climate zones shifting so as to allow the re-distribution of species. According to a syndicated press report, an Australian biologist Dr. Don Sands, has warned that many species are suffering from such changes, especially in the sub-tropical coastal zone, stretching from Grafton in New South Wales north to Gladstone in Queensland. Invertebrates threatened by this change include rare butterflies such as the Australian Fritillary *Argyreus hyperbius inconstans* and Illidge's Ant-blue butterfly *Acrodipsas illidgei*. The latter depends on ants that nest in the mangroves and that are unlikely to survive if the drying continues, according to Don Sands.

In the Wet Tropics region, other species are under threat from reduced rainfall, according to Dr Tony Clarke of the Queensland



University of Technology. These include endemic butterflies such as the Cairns Birdwing *Ornithoptera euphorion*. Tony Clarke points out that Australia has about 520,000 named insects, of which about half live in the Wet Tropics. He therefore thinks that tens or hundreds of thousands of species could be under threat from climate change.



RESEARCH NOTES

Avermectins: a newly recognised threat?

It is well known that the anti-helminthic drug ivermectin and other avermectins are very harmful to dung-feeding invertebrates (see *ICN* Nos. 23, 36 and 30). It is, perhaps, not widely appreciated that the leaching of avermectins into watercourses and water bodies can harm aquatic invertebrates. In a study published in 2005, Jennifer Kövecses and David J. Marcogliese of the St. Lawrence Centre in the Quebec Region of Canada have shown that significant amounts of ivermectin are entering water bodies. Although ivermectin is sparingly soluble in water, it is transported into water bodies by soil erosion. In a range of water catchments in Quebec, the rate of erosion ranges from 1 to 11 tonnes per hectare. The authors estimate that, at this rate, between 200 and 2,200 mg of ivermectin can be transported per hectare.

In assessing the possible impacts of avermectins on non-target freshwater organisms, the authors considered available toxicity values for a range of species, together with data for rates of the deposition and the subsequent degradation of these substances. They are critical of some previous studies which indicated that the two main avermectins – ivermectin and abamectin – did not pose a significant risk to freshwater environments. It now seems, however, that insufficient attention was paid to certain important details. These include the distinction between dissolved avermectins and those contained in sediments. Also the sub-lethal effects of avermectins had not been fully considered in earlier work. Subsequent studies showed, for example, that the oligochaete worm *Lumbriculus variegatus* can survive concentrations of abamectin of as much as 560 nmol, but that a concentration of 300 nmol is sufficient to inhibit its ability to move, swim and crawl.



Some of the studies reviewed by the authors included population counts of various aquatic invertebrates in the presence of avermectins. For example, they cite a study in which abamectin caused significant reductions in the number of Ephemeroptera larvae (particular *Baetis* spp.), Coleoptera larvae, Hemiptera nymphs and chironomid larvae

Another problem is that avermectins are used not only to treat livestock on land, but also farmed fish such as salmon. The authors cite studies showing that the marine sediment in the vicinity of fish cages is toxic to benthic invertebrates, even 100 days after the drug has been administered to the fish.

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PAST UK MEETINGS

Zoological Society of London symposium, 1-2 November 2007

An AES poster entitled 'Insect conservation - biology's ugly duckling?' was presented at a two-day symposium held by the Zoological Society of London ("*Trade-offs in Conservation: Deciding what to Save*"). The poster was designed to remind symposium delegates that invertebrate conservation is at least as important as the conservation of larger vertebrates, which was a major focus of the symposium. In this context, the poster showed data which seem to confirm that the conservation of insects and other invertebrates is still seen as an ugly duckling.

The metaphor of the ugly duckling was perhaps ironic in view of some of the data displayed on the AES poster. The data included the funds that UK NGOs targeted towards the conservation of particular taxa during the previous financial year. Of this amount, 90% was allocated primarily to birds. A mere 2.5% of the total was allocated primarily towards the conservation of invertebrates. Since birds form only about 1% of the total UK fauna, compared with 65.6% for insects and about 98% for all invertebrates, a major imbalance seems to persist.

The AES poster included the following commentary on the taxonomic discrimination that often characterises human treatment of different



kinds of wildlife. "Feeding of birds is often 'officially' encouraged, in the absence of any research data about potential harm to populations of invertebrates, which become prey for an artificially boosted population of birds. The choice whether to feed birds appears to be influenced by selectively positive attitudes towards them, as compared with other species. Equally, the choice to use electrocution traps for insects out-of-doors seems to be influenced by an irrationally negative attitude towards them. The significance of this comparison can be appreciated by imagining that householders were being encouraged to electrocute birds and to feed insects."

There were two other invertebrate contributions: a poster from the Bumblebee Conservation Trust and a general talk on invertebrate conservation by Prof. Michael Samways of the University of Stellenbosch, South Africa. A copy of the poster is being made available to AES members via the society's new website.

Natural England workshops, October 2007

Following the formation of Natural England as the new government agency to replace English Nature, Dr. Roger Key has been appointed as the Senior Specialist in Education & Learning in the organisation's Social & Economic Evidence Team. His interest and commitment in this field became well known during the many years when his duties were primarily concerned with invertebrates. Roger's first major initiative in his new post was to run a series of four workshops in Reading, Berkshire last October, with the aim of setting the direction of Natural England's work in 'education and learning in, about and for the natural environment'. A related aim is to establish links with partners who have an active interest and involvement in that area.

It is reported that the workshops went very well and it is hoped that a future issue of ICN will include a summary of the proceedings. In the meantime, readers might be interested to see the titles of the three workshops which had specific themes. These were as follows: "*Learning for and in the workplace*" (covering formal qualifications from 6th form upwards, careers advice and continuing professional development); "*Learning at home and at leisure*" (covering informal learning at all ages); "*Children & Young People*" (covering the period up to and including school-leaving age).

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